

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

COMPLETE LISTING OF CLAIMS:

Claims 1-7 : (Canceled)

Claim 8 : (Currently Amended) A coaxial microwave plasma torch, comprising:

a solid cylindrical outside conductor;

a cylindrical electric discharge tube ~~fixedly~~ inserted into, and fixed to, an axial hole at one end of said electric discharge tube, said axial hole being formed in said outside conductor on one end face ~~side~~ of said outside conductor, said electric discharge tube having another end protruding from said axial hole; and

a coaxial cable for microwave transmission, ~~said coaxial cable having one end~~ fitted at one end of said coaxial cable to an other end face ~~side~~ of said outside conductor from outside, wherein

an antenna is electrically connected to an ~~inside~~ inner conductor of said coaxial cable ~~is provided at one end thereof~~ at said one end of said coaxial cable,

a through-hole, ~~extending~~ is formed in said outside conductor in such a way that said through-hole extends in an axial direction from the other end face ~~side~~ of said outside conductor toward said axial hole, ~~is formed in said outside conductor,~~

said antenna ~~extends, in a state~~ is electrically insulated from said outside conductor; ~~conductor and extends~~ into said electric discharge tube along the axial direction through said through-hole,

an ~~outside~~ outer conductor of said coaxial cable is electrically connected to said outside conductor, ~~and~~

a gas inlet pipeline for supplying gas into said electric discharge tube is provided in said outside conductor, and

a cylindrical space is formed between a peripheral surface of said axial hole of said outside conductor and an outer surface of said electric discharge tube, said cylindrical space having a predetermined radial length and extending in the axial direction from a bottom face of said axial hole at an arbitrary length such that said cylindrical space does not reach said one end face of said outside conductor.

Claim 9 : (Canceled)

Claim 10 : (Currently Amended) A coaxial microwave plasma torch, comprising:

a torch body with a double-tube configuration ~~having~~ which consists of a cylindrical outside conductor; and

a cylindrical electric discharge tube arranged ~~with a space kept in a radial direction~~ inside said outside conductor at a radial spacing therebetween, wherein

said outside conductor of said torch body has one end opening closed with a lid,

said electric discharge tube ~~has one end~~ is fixed to said lid at one end thereof and an other end ~~protrudingly extending of said electric discharge tube protrudes~~ from an other end opening of said outside conductor of said torch body,

a coaxial cable for microwave transmission; ~~said coaxial cable having one end fitted~~ is attached at one end thereof to said lid of said outside conductor of said torch body from outside,

an antenna electrically connected to an ~~inside~~ inner conductor of said coaxial cable is fitted to ~~one end thereof~~ said one end of said coaxial cable,

said antenna ~~extends, in a state~~ is electrically insulated from said ~~lid,~~ lid and extends into said electric discharge tube of said torch body through a through-hole formed in said lid,

an ~~outside~~ outer conductor of said coaxial cable is electrically connected to said outside conductor of said torch body, and

a gas inlet pipeline is arranged in said torch body for supplying gas into said electric discharge tube of said torch body is provided in said torch body, and

a cylindrical auxiliary conductor is fitted from an other end opening of said outside conductor into a cylindrical space between said cylindrical outside conductor and said electric discharge tube in such a way that said cylindrical auxiliary conductor can slide along an axial direction of said electric discharge tube while preventing leakage of a microwave from a gap between said cylindrical auxiliary conductor and said outside conductor and a gap between said cylindrical auxiliary conductor and said electric discharge tube, and being in electrical contact with said outside conductor so as to adjust a phase of the microwave.

Claim 11 : (Canceled)

Claim 12 : (Currently Amended) The coaxial microwave plasma torch according to claim 10, wherein said gas inlet pipeline extends from the outside of said torch body into a cylindrical space between said outside conductor and said electric discharge tube through both or either of said outside conductor and said lid, ~~and then is~~ is connected to said electric discharge tube, ~~to open and opens~~ to a region in a vicinity of a top of said antenna in said electric discharge tube.

Claim 13 : (Currently Amended) The coaxial microwave plasma torch according to claim 10, wherein

said lid of said torch body ~~at least has an~~ has at least a solid cylindrical inserting section ~~which is made of a cylindrical of~~ dielectric material and which is inserted into said outside conductor,

said electric discharge tube ~~has one end~~ is fixed to said inserting section at one end thereof, and

said gas inlet pipeline includes:

a tube portion ~~having an of~~ electrical insulating property and passing insulation extending through said outside conductor of said torch body from the outside of said torch body;

a first tube portion connected to said tube portion and ~~passing~~ extending through said inserting section of said lid; and

a second tube portion connected to said first tube ~~portion and~~ portion, extending inwardly along a radial direction in ~~the inside of~~ said antenna and then extending ~~in~~ along

the axial direction toward a top of said antenna in ~~the inside thereof, to~~ in said antenna so as to open to at said top.

Claim 14 : (Currently Amended) The coaxial microwave plasma torch according to claim 8, wherein said antenna ~~is made~~ consists of said ~~inside~~ inner conductor of said coaxial cable.

Claim 15 : (Currently Amended) The coaxial microwave plasma torch according to claim 10, wherein said antenna ~~is made~~ consists of said ~~inside~~ inner conductor of said coaxial cable.